An important aspect of this invention is that the pulse ON time of the pulse-modulated high frequency voltage is not longer than 50 μsec, more preferably not longer than 10 μsec. Fig. 4 of the instant application, based on experimental data, illustrates that this low ON time (i.e., no greater than 50 μsec) used when forming the i-layer 24 surprisingly results in improved photoelectric conversion efficiency for the overall solar cell.

Claim 1 stands rejected under 35 U.S.C. Section 103(a) as being allegedly unpatentable over Moustakas (US 4,407,710) in view of Shinichi (JP 7-183227). This Section 103(a) rejection is respectfully traversed for at least the following reasons.

Claim 1 requires that "the i-layer is formed by a plasma CVD method employing plasma discharge caused by application of a pulse-modulated high frequency voltage having a pulse ON time of not longer than 50 μsec and a duty ratio of not higher than 50% to improve a photo-electric conversion efficiency of the solar cell." As explained above, and illustrated in Fig. 4 of the instant application, using an ON time of not longer than 50 μsec has surprisingly been found to improve efficiency of the solar cell. The cited art fails to disclose or suggest this aspect of claim 1, either alone or in the alleged combination.

The Office Action admits that Moustakas fails to disclose or suggest the aforesaid aspect of claim 1. Recognizing this deficiency in Moustakas, the Office Action cites to Shinichi. However, Shinichi also fails to disclose or suggest forming at least part of an i-layer by application of a pulse-modulated high frequency voltage having a pulse ON time of not longer than 50 μsec as required by claim 1. Instead, Shinichi teaches directly away from this aspect of claim 1 by teaching that the ON time should be from 150-1,000 μsec

(a range *well above* the range required by claim 1) (e.g., see Shinichi at paragraphs [0017] and [0018]).

Thus, not only does the alleged combination fail to disclose or suggest the invention of claim 1, but it teaches directly away from claim 1 by requiring an ON time of from 150-1,000 μsec. Thus, even if the references were combined as alleged in the Office Action (which applicant believes would be incorrect in any event), the invention of claim 1 still would not be met.

New claim 6 requires that the i-layer is formed by a plasma CVD method comprising employing plasma discharge caused by application of a pulse-modulated high frequency voltage having a pulse ON time of not longer than 50μsec to improve a photo-electric conversion efficiency of the solar cell. Again, the cited art fails to disclose or suggest this aspect of new claim 6.

For at least the foregoing reasons, it is respectfully requested that all rejections be withdrawn. All claims are in condition for allowance. If any minor matter remains to be resolved, the Examiner is invited to telephone the undersigned with regard to the same.

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS

1. (Amended) A solar cell production method comprising the steps of:

forming a first electrode layer on a substrate,

sequentially forming a p-layer, an i-layer and an n-layer [of]comprising amorphous silicon on the first electrode layer, and

forming a second electrode layer on the n-layer,

wherein the i-layer is formed by a plasma CVD method employing plasma discharge caused by application of a pulse-modulated high frequency voltage having a pulse ON time of not longer than 50μsec and a duty ratio of not higher than 50% to improve a photo-electric conversion efficiency of the solar cell.

2. (Unamended) A solar cell production method as set forth in claim 1, wherein the pulse ON time is not longer than 10μsec and the duty ratio is not higher than 20%.

Please add the following new claims:

6. (New) A method of making a solar cell, the method comprising:

forming a first electrode layer so as to be supported by a substrate,

forming a p-layer, an i-layer and an n-layer comprising amorphous silicon over the first electrode layer, and

thereafter forming a second electrode layer,

wherein the i-layer is formed by a plasma CVD method comprising employing plasma discharge caused by application of a pulse-modulated high frequency voltage having a pulse ON time of not longer than 50μsec to improve a photo-electric conversion efficiency of the solar cell.

7. (New) The method of claim 6, wherein the pulse ON time is not longer than 10μsec, and a duty ratio of the pulse-modulated high frequency voltage is not higher than 20%.

8. (New) The method of claim 6, wherein a duty ratio of the pulse-modulated high frequency voltage is not higher than 50%.